# NOAA Pacific Islands Technical Assistantship
# Working Project Plan

## Hawai`i Coastal Zone Management Program
## December 2001

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## Introduction

The Pacific Islands GIS Technical Assistant in Hawaii works jointly with the Hawaii Coastal Zone Management (CZM) and Statewide GIS Programs. These programs are both within the State Office of Planning, an agency administratively attached to the Department of Business, Economic Development, and Tourism. CZM is presently working with the GIS Program (through funding, coordination and staffing) to acquire existing GIS data and develop mapping products. This collaboration will improve CZM assessment and management of coastal zone-related activities, including coastal erosion and natural hazards mitigation, nonpoint source pollution control, and ocean resources management.

The following pages provide an overview of the projects in which the Hawaii assistant will be involved. Nearly all of the projects described concern a significant number of partners, requiring communication and coordination of data and resources. Many of the projects are ongoing for the duration of the assistantship (until October 2003), and two projects in particular will continue after the assistantship is completed. These projects, the Cumulative and Secondary Impacts (CSI) Mitigation Project and Revision of the Ocean Resources Management Plan (ORMP), are Section 309 Enhancement Grant priority areas, and are part of the CZM Program's five-year strategy for Fiscal Years 2001-2005.

The assistant's specific activities and schedules for each project, or task, listed below are explained in the sections that follow. This is a dynamic document, however, and tasks may be adjusted as the need arises.

***Cumulative and Secondary Impacts (CSI) Mitigation: Development of an Ahupua`a Framework***

As a result of significant economic growth and an increase in population, development demands present a formidable challenge to sustainable management of Hawaii's natural resources. Problems associated with rapid growth include increased nonpoint source pollution, water quality degradation, wetland decline, threats to traditional subsistence gathering and access, and threats to endangered species. Cumulative and secondary impacts (CSI) were therefore selected as one of three Section 309 Enhancement Grant priority areas for the Hawaii CZM Program. The goals of CSI mitigation are to develop, implement, and institutionalize an integrated planning approach that enables CZM to assess and manage CSI on the basis of traditional Hawaiian ahupua`a management concepts.

Ahupua`a management is similar to the watershed management approach in that it conforms to the existing geography and its resources, and strives to enhance the productivity of the land to benefit natural and human ecosystems, rather than altering them simply for human convenience. An ahupua`a is an ancient land division, still used today, which typically extends from mauka (inland or mountains) to makai (the sea) along ridges, streams or other natural features. Beyond its description of the physical or social history of a land boundary, the ahupua`a represents a distinctive stewardship relationship between island people and their land, and provides practical and rational concepts of resources management to insure the sustainability of the natural environment and safeguard against pollution and over-exploitation.

Eventually, ahupua`a and watershed concepts will be incorporated into CZM's enforceable policies to provide an integrated planning approach for assessing and managing CSI impacts. State statutes, State and County rules, and administrative policies will be modified, resulting in changes to CZM network elements, such as the Special Management Area permitting process and other regulatory programs. As a pilot project for developing an ahupua`a framework and reinforcing state and local partnerships, CZM is working with the community of Waianae (West Oahu), and plans to expand to

other communities statewide. The Waianae project will include (a) identification of historical and cultural information for Waianae that may be utilized in the development of their ahupua`a management framework; (b) identification of key issues of the community in regard to CSI; (c) development of educational materials (informational handouts, GIS map posters, etc.) and organization of outreach events to build support for the utilization of the ahupua`a management framework in community resources management; and (d) development of a template for management that will be shared with other communities statewide.

***Revision of the State Ocean Resources Management Plan (ORMP)***

The overall purpose of this project is to improve ocean resources management on a statewide basis. The 1991 Ocean Resources Management Plan (ORMP) that was adopted by the Legislature in 1994 synthesized management issues in ten ocean and coastal sectors and suggested specific initiatives. The sector issues addressed in the 1991 Plan are: Ocean Research and Development, Ocean Recreation, Harbors, Fisheries, Coastal Hazards, Aquaculture, Marine Ecosystem Protection, Waste Management, Energy, and Marine Minerals. To address the current and future state of ocean resources, the ORMP will be revised and updated to provide a more strategic approach to ocean resource management that coordinates the management of ocean resources by government, private industry, the scientific and academic communities, and the public.

An important part of the revision process is the hosting of an Ocean Summit and pre- and post-Summit activities that will bring together the various ocean-related sectors with the public to develop appropriate tools for achieving sustainable ocean and coastal environments. Pre- and post-Summit activities also aim to generate community awareness and participation in the revised ORMP. Through the Ocean Summit and its related workshops, amended objectives and priorities will be developed, and implementation guidelines will be established to ensure successful execution of the revised ORMP. Ocean Summit activities and the ORMP update will focus on main elements: (a) facilitating integrated ocean and coastal management, including watershed and ahupua`a management; (b) incorporating public input through citizen participation in pre-Summit workshops, Summit discussions, and post-Summit focus groups; (c) incorporating elements of existing projects and programs (local and from abroad) that have been successful; and (d) developing strong partnerships to revise and implement the updated ORMP. These key elements integrate well with CZM's vision to partner with Hawaii's network of communities to promote a sustainable ocean and coastal environment by building upon practical concepts from island traditions and fostering coordinated island stewardship.

***Open Ocean Aquaculture Feasibility Project***

In partnership with the Statewide GIS Program, University of Hawaii Sea Grant Program, and the Hawaii Department of Agriculture, CZM has been involved in a multi-year project that began in September 2000 to use GIS data for Hawaii's offshore waters to evaluate the feasibility of an open ocean aquaculture industry. The project intends to delineate suitable offshore aquaculture sites within the main eight Hawaiian Islands that could be developed as marine aquaculture parks, by utilizing GIS and by reviewing applicable State and Federal regulations. Data gathered for this project include bathymetry, currents, substrate, state and federal boundaries, essential fisheries, harbors, military areas, recreational areas, coral reefs, vessel routes and sanctuaries. In addition, State and Federal policies and regulatory processes will be examined to identify any inconsistencies that would hinder aquaculture project development and the siting of open ocean cages.

***GIS Training Courses and Materials***

Many State staff members are unaware of the applicability of GIS to resource management projects and of the important role GPS and remote sensing information can play. A survey of the Office of Planning and DAR will indicate the appropriate starting point for State staff training by identifying

current expertise and interest. Training courses may include (but are not limited to) an introduction to GIS application to coastal resource management, introductory and intermediate ArcView, introduction to remote sensing, introduction to GPS, and projection and datum basics. These workshops are dependent on computer, space, instructor, and funding resources, and will likely result from partnering with the Pacific Services Center, the Coastal Services Center, the University of Hawaii, and others. As one of the primary objectives of the assistantship, building GIS capacity for State resource managers can be accomplished through appropriate and thorough training.

***Coordination and Data Sharing With CZM Program Partners***

The integration of GIS activities between CZM and its partners is essential for effective use and capacity building for GIS technology. As such, communication between these partners is fundamental for establishing a data resource network. Facilitation and coordination of projects with other partners to enhance project synergy will be achieved through participation with various GIS user and coastal resource groups. An example of where the assistant can be effective in coordinating data sharing and application is on coral reef initiative projects. As a result of improved coordinated efforts, products will include more accurate and multi-purpose GIS maps that partners can utilize more effectively.

***Open Ocean Data Repository***

One of the primary goals of the Statewide GIS Program is to improve the overall efficiency and effectiveness in government decision-making through the development, maintenance, and sharing of database applications via GIS mapping technologies. Of all datasets, the GIS Program needs to develop its open ocean data repository, which currently includes layers for coastal resources and fish aggregating devices, and NOAA nautical charts. There are several potential open ocean data sources, including datasets obtained for the Open Ocean Aquaculture Feasibility Project and remote sensing data that may be available through DLNR and the NOS NCCOS Coral Reef Mapping Initiative.

***Metadata Creation and Maintenance***

Metadata is an essential component of valid, user-friendly, up-to-date and shareable data. For the most part, data currently in the State GIS network is not FGDC compliant, and many datasets are missing metadata altogether. These data will be identified and metadata created or updated during the course of the assistantship.

***Outreach Materials for the Hawaiian Islands Humpback Whale National Marine Sanctuary***

The purpose of this project is to produce a color GIS map and poster depicting traditional Hawaiian natural resources use within the Hawaiian Islands Humpback Whale National Marine Sanctuary (NMS) to use as a public outreach and education tool. The poster will depict traditional extractive uses such as limu (seagrass) harvesting, nonextractive uses including spiritual sites and recreation, and other coastal and marine resource-related sites. No new fieldwork will be performed; data will be gathered from existing maps, GIS layers, coastal use atlases, and other sources. The map will primarily serve as an educational outreach tool for the general public, as well as a useful reference for NMS staff and native Hawaiians seeking data on the area within the Sanctuary. CZM will have access to the data acquired for this project and the results can be used for other coastal zone management projects (e.g. the aquaculture project, assessing the impact of cruise ships within the NMS area, fiber optic cable burying within the NMS area, etc.).

***GIS Day Events***

GIS Day is an annual national event aimed at educating children on the importance and application of geography and GIS. GIS Day 2001 was the third year the City and County of Honolulu's Department of Planning and Permitting coordinated GIS Day activities for interested schools. On Wednesday, November 14, approximately 250 fourth and fifth grade students from Solomon and

Kaleiopuu Elementary Schools participated in GIS Day activities at the McCoy Pavilion at Ala Moana Beach Park in Honolulu. For this year's event, the CZM and GIS Programs' team of volunteers provided an interactive computer mapping exercise aimed at increasing the students' awareness of the value of GIS in stream conservation efforts on Oahu. Through the guided exercise, students identified their schools, rare and endangered plants, animals, invertebrates, and natural communities, and determined which parts of Oahu receive the most annual sun and rainfall. In addition, students learned about ahupua`a, or ancient Hawaiian land boundaries (from the mountains to the sea), and determined the ahupua`a where their schools are located. The event was exciting for volunteers and students alike, and the CZM and GIS Programs plan to participate at GIS Day 2002. As with GIS Day 2001, the assistant will develop the ArcView project and create the materials according to the event's theme.

***Statewide GIS Program Website***

The Statewide GIS Program's current website will be renovated to include updated information, as well as a new "look" and theme.

***Statewide GIS Program Policies & Procedures for Charging Fees for Map Products and Services***

The GIS Program is preparing rules that will govern the Program's ability to charge fees or receive in-kind services from government agencies, private and community organizations, and individuals for maps, products and services. Regulations to formalize a fee schedule for providing map products over the Internet are currently being developed.

***Additional Activities***

- **Marine Ecosystem GIS (MEGIS) Participation**

  The MEGIS work group is a venue for exchange of ideas, technology, and data among those with vested interests in the near-shore environment of Hawaii and US-affiliated islands in the Pacific. Participants vary among federal, state, and local governmental agencies, academia, private sector, and non-governmental organizations.

- **Hawaii Geographic Information Coordinating Council (HIGICC) Participation**

  HIGICC is a body consisting of members of Hawaii's GIS community. The goal is to coordinate GIS activities among a wide range of GIS users to avoid duplication of effort, promote data sharing, and maintain data standards throughout the state.

- **ESRI Hawaii GIS Users Group**

  The intent of the Hawaii Users Group is to bring together ESRI software users to share ideas, present projects, and meet with ESRI representatives and other users. Meetings provide networking opportunities with other GIS users, information on upcoming developments in ESRI software, the opportunity to question ESRI representatives, and to learn new tips and tricks.

***Other Project Possibilities***

- Proposed project utilizing Landsat land cover imagery in partnership with the Coastal Services Center's Coastal Remote Sensing Program
- Proposed ecological characterization CD-ROM project in partnership with the Coastal Services Center's Land Characterization and Restoration Program
- GPS mapping and data collection project for the Waianae community to supplement the CSI Mitigation Project/Ahupua`a Management Initiative

## Approach

| Task 1 | Assist in Development of Ahupua`a Management Framework for Cumulative and Secondary Impacts (CSI) Mitigation |
|---|---|
| **Activity** | • Gain support for ahupua`a approach to land management with a pilot project in Waianae to be applied in other communities.<br>• Make contacts with Waianae community members and organizations.<br>• Create a visual outreach product that depicts land use and land cover change in last century (or less) and provides traditional and contemporary planning strategies for resource management.<br>• Work with community to create standard ahupua`a spatial data for Oahu |
| **Deliverable(s)** | • Initial moku framework for mitigating CSI, with attention to issues including native Hawaiian and public access.<br>• Poster or other visual outreach tool for the Waianae community<br>• "Traditional Hawaiian Land Boundaries" standard map for distribution |
| **Date** | End of assistantship |

| Task 2 | Assist with Revision of the State Ocean Resources Management Plan (ORMP) |
|---|---|
| **Activity** | • Assist with development of the Ocean Summit conference and pre-summit workshops.<br>• Inform the marine GIS community of ocean-related policy activities and encourage participation at ORMP workshops.<br>• Gather input for solutions for implementation of the State ORMP.<br>• Assist the revision of the State ORMP.<br>• Act as staff support for the Citizens Advisory Group subcommittee on ORMP Implementation |
| **Deliverable(s)** | • Community support and participation throughout ORMP revision process. |
| **Date** | End of assistantship |

| Task 3 | Co-Lead Open Ocean Aquaculture Feasibility Project |
|---|---|
| **Activity** | • Provide the University of Hawaii Department of Urban & Regional Planning Research Assistant, with data, GIS computer assistance, metadata support, and data contacts. |
| **Deliverable(s)** | • Statewide data relevant to assessing the feasibility of commercially viable open ocean aquaculture cages. |
| **Date** | Project completion expected June 2002 |

| Task 4 | Develop State Staff GIS Training Courses and Materials |
|---|---|
| **Activity** | • Create and distribute questionnaire to determine Office of Planning and Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR) staff GIS, GPS, and remote sensing training interest and needs.<br>• Collaborate with the Office of Planning, DAR, Pacific Services Center, Coastal Services Center, ESRI Hawaii, the University of Hawaii, and possibly the Manoa Innovation Center to provide introductory level training to Office of Planning and DAR staff.<br>• Create training materials or assist in material creation for courses to be offered. |
| **Deliverable(s)** | • Increased staff understanding of GIS, GPS, and remote sensing data capabilities and applicability to their projects. |
| **Date** | End of assistantship |

| Task 5 | Facilitate Data Sharing and Coordination with CZM Program Partners |
|---|---|
| **Activity** | • Increase communication between partners, resulting in an awareness of shared goals and products, with the potential for data and data source sharing.<br>• Coordinate GIS, GPS, and remote sensing training |
| **Deliverable(s)** | • Inter-project coordination |
| **Date** | End of assistantship |

| Task 6 | Enhance the GIS Program's Open Ocean Data Repository |
|---|---|
| **Activity** | • Acquire open ocean data and establish contacts with data sources |
| **Deliverable(s)** | • Increased data access for CZM and GIS Programs |
| **Date** | End of assistantship |

| Task 7 | Create and Maintain Metadata |
|---|---|
| **Activity** | • Develop the GIS program's metadata files and bring existing metadata in compliance with FGDC standards. |
| **Deliverable(s)** | • Compliant metadata within State GIS network |
| **Date** | End of assistantship |

| Task 8 | Develop Outreach Materials for the Hawaiian Islands Humpback Whale National Marine Sanctuary |
|---|---|
| **Activity** | • Create an educational poster for the National Marine Sanctuary that includes GIS maps, discusses traditional Hawaiian concepts such as kapu and ahupua`a, and details how traditional people used the sanctuary's resources. |
| **Deliverable(s)** | • Outreach poster |
| **Date** | To be determined |

| Task 9 | Develop Interactive ArcView Applications for GIS Day Events |
|---|---|
| **Activity** | • Build GIS Day 2001 ArcView project and presentation, particularly to include streams conservation information and to facilitate instruction of the groups.<br>• Create new interactive project based on national and regional GIS Day themes for GIS Day 2002.<br>• Develop an instructional packet for the children to follow (2001 and 2002).<br>• Install the project on City & County of Honolulu computers (2001 and 2002).<br>• Assist with instruction (2001 and 2002). |
| **Deliverable(s)** | • GIS Day ArcView project and workstation manual for each computer station, with focus on streams or other themes<br>• GIS Day participation |
| **Date** | November 14, 2001 (GIS Day 2001); November 2002 (GIS Day 2002 TBA) |

| Task 10 | Renovate GIS Program Website |
|---|---|
| **Activity** | • Develop a GIS Program logo<br>• Provide very basic metadata education and require metadata is downloaded with files (make it "part of the package").<br>• Assist with development of standards for data quality, such as communication with users to guarantee data is valid and up-to-date.<br>• Incorporate other web development ideas, including development of ArcIMS applications |
| **Deliverable(s)** | • GIS Program brochures with new logo and information<br>• Enhanced website<br>• Additional interactive mapping applications |
| **Date** | End of assistantship |

| Task 11 | Assist with Development of GIS Program Policies & Procedures for Charging Fees for Map Products and Services |
|---|---|
| **Activity** | • Review and revise draft "Request for the Adoption of Rules to Charge Fees for Maps, Products and Services." |
| **Deliverable(s)** | • Final GIS Program protocol for the Shopping Cart Application/Special Fund |
| **Date** | ASAP |

## Schedule of Activities

| Task No. | Event | Start Date | Milestone Date | Deliverable Date |
|---|---|---|---|---|
| **1** | Gain support in Waianae community & make contacts with community members and organizations<br>• Attend Hawaii Aquatics Conference in Waianae<br>• Meet with representative of Waianae Civic Club | <br><br>11/3-4/01<br>11/27/01 | Ongoing | End of assistantship |
| **1** | Assist with creation of a visual outreach product that depicts land use and land cover change in last century (or less) and provides traditional and contemporary planning strategies for resource management. | | | To Be Determined (TBD) |
| **1** | Work with the community to create standard ahupua`a spatial data for Oahu | | | TBD |
| **2** | Assist with planning for pre-summit workshops, roadshow, and Ocean Summit | 11/01 | | |
| **2** | Build support for Ocean Summit; research issues for pre-summit workshops/roadshow | 12/01 | Ongoing | |
| **2** | Inform the marine GIS community of ocean-related policy activities and encourage participation at ORMP workshops. | 1/02 | Ongoing | |
| **2** | Commence with pre-summit workshops/roadshow | 3/02 | | 10/02 |
| **2** | Ocean Summit | | | 11/13-15/02 |
| **2** | Commence with post-summit activities | 2/03 | | |
| **2** | Assist with revision of first draft of updated ORMP | *12/02* | | 5/03 |
| **2** | Assist with revision of final draft of updated ORMP | 8/03 | | 1/04; End of assistantship |
| **3** | Provide assistance as needed to Research Assistant | 11/01 | | 6/02 |
| **4** | Create questionnaire to determine Office of Planning and Division of Aquatic Resources GIS/GPS/Remote Sensing training needs | 11/01 | | |
| **4** | Distribute revised questionnaire to staff | Mid-1/02 | | |
| **4** | Collect questionnaire and assess results | | | Mid-2/02 |
| **4** | Assist with *GIS for Managers* training, if feasible for PSC to offer to staff | | | End of 3/02 |
| **4** | Assist with other training courses: logistics, materials, presentations | | Ongoing | End of assistantship |
| **5** | Facilitate communication between CZM and GIS Programs' Partners<br>• Present to MEGIS on my role here | <br>1 or 2/02 | Ongoing | End of assistantship |
| **6** | Acquire open ocean data and establish contacts with data sources | 11/01 | 6/02 | End of assistantship |
| **7** | Inventory Office of Planning GIS data | 1/02 | | |
| **7** | Identify updating and metadata needs | 2/02 | | |
| **7** | Commence creating FGDC compliant metadata | 3/03 | | |
| **7** | Assist with metadata training | TBD | | |
| **8** | Conduct research on traditional uses within NMS and pull together necessary data | 12/01 | | |
| **8** | Outreach poster complete | | | TBD |
| **9** | Plan and execute GIS Day 2001 | | | 11/14/01 |
| **9** | Plan and execute GIS Day 2002 | | | 11/01 |
| **10** | Create GIS logo | 10/01 | | TBD |
| **10** | Draft new website look | | 3/02 | |
| **10** | Renovate website to include metadata when data is downloaded | | | TBD |
| **11** | Assist with revised draft of Policies for Charging Fees for Map Products and Services | | 2/02 | |

## Travel

| Conferences Attended To Date, 2001 | Location | Date |
|---|---|---|
| Hawaii Aquatics Conference | Waianae | November 3 and 4, 2001 |
| Hawaii ESRI User's Meeting | Honolulu | November 8, 2001 |
| GIS Day | Honolulu | November 14, 2001 |
| Hawaii Congress of Planning Officials (HCPO) Conference | Honolulu | November 21, 2001 |
| Pacific Coral Reef Monitoring and Mapping Meeting (Status of Pacific Mapping) | Honolulu | December 13, 2001 |

| Required | Conferences 2002 | Location | Date |
|---|---|---|---|
| Yes | ArcInfo Training | TBD | TBA |
| | Vessel Groundings Meeting | Honolulu | January 2002 |
| | Solutions to Coastal Disasters | San Diego | February 24-27, 2002 |
| | GISMAP 2002 | Honolulu | May 7-9, 2002 |
| | Asia-Pacific Marine Science & Technology? | Kuala Lumpar, Malaysia | May 12-16, 2002 |
| | Coastal Zone Asia Pacific? | Bangkok | May 12-16, 2002 |
| Yes | All Islands | Guam | June 2002 |
| | EPA Water Quality Conference | Palau | June 2002 |
| Yes | ESRI Conference | San Diego | July 8-12, 2002 |
| | PACON 2002? | Chiba, Japan | July 21-26, 2002 |
| | World Congress on Aquatic Protected Areas | Cairns, Australia | August 14-17, 2002 |

| Required | Conferences 2003 | Location | Date |
|---|---|---|---|
| Yes | Coastal GeoTools | Charleston | January 2003 |
| Yes | CZ03 | Baltimore | July 2003 |

## Required Resources

### *Staffing*

The assistance of Coastal Services Center staff, particularly an ESRI certified trainer, is anticipated for GIS, GPS, and remote sensing training courses we would like to offer to the Office of Planning and the Division of Aquatic Resources. We are currently distributing a questionnaire to determine State staff training needs and interest, the results of which we hope will drive a series of training workshops. This ambitious initiative will train staff on the applications of GIS, introductory and intermediate level ArcView, remote sensing basics, and GPS, through the coordinated efforts of the assistant, Pacific Services Center staff, the Coastal Services Center, and other partners.

### *Hardware*

At this point no additional hardware needs are anticipated.

### *Software*

An HTML creation program, such as Dreamweaver, would be useful.

### *Supplies*

At this point, no additional supplies are anticipated.

### *Training*

There are several training courses that would be advantageous for the assistantship, including ArcInfo training offered by the Pacific Services Center, currently planned for 2002. ArcIMS, Avenue, and VisualBasic training would also be beneficial.

## Evaluation Plan

An evaluation of the assistant's progress will be conducted by the Project Mentor and the CZM and GIS Program Managers during September 2002 and September 2003 in order to determine: (1) tasks accomplished; (2) what the assistant has learned through various project involvement; and (3) the assistant's technical and training needs. The assistant's performance will be based on the following criteria:

1. General work practice (e.g. punctuality, participation, and ability to work well with other staff);
2. Ability to understand the objectives of the Hawaii Coastal Zone Management Program and the Hawaii Statewide GIS Program;
3. Ability to coordinate projects with multiple partners in government, private sector, academics, and community organizations;
4. Extent to which GIS, GPS, and remote sensing skills have been utilized in projects; and
5. Ability of assistant to be a creative problem-solver and share ideas with staff and partners.

Critique of the Pacific Islands GIS Project's effectiveness will also be discussed during this time. Summary of Evaluation Discussions will be forwarded to the NOAA Coastal Services Center Pacific Islands GIS Project coordinators once completed.

## Working Project Plan Approval Process

Island GIS Assistant Signature

Rebecca M. Pollock Date

Island GIS Mentor Signature

Leanora Dizol Kaiaokamalie Date

Island CZM Program Manager Signature

Christopher G. Chung Date

Island GIS Project Lead Signature

Craig Tasaka Date

NOAA Project Lead Signature

Cindy Fowler Date